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In replying please address:

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Rec'd ED
8/3/59
9:00

July 31, 1959

Dear Sir:

As a result of recent discussions with your technical representative, we are submitting herewith a proposed program of research directed toward the development of a small experimental incinerator for the destruction of papers and documents normally stored in safes and filing cabinets.

Under Task Order No. Z, an experimental air-film-cooled incinerator has been developed that provides an average burning capacity of approximately 200 pounds of paper per hour for operations under normal every-day conditions, and of approximately 500 pounds per hour for operations under emergency conditions as anticipated. This experimental unit is being evaluated at this time by your technical representatives and their associates under field conditions, and appears to be operating quite satisfactorily. Further efforts under Task Order No. Z are currently being directed toward the investigation of selected modifications of this experimental incinerator design and toward the incorporation, in a second experimental unit with a similar burning capacity, of any modifications which are mutually considered meritorious, within the limits of the time and funds provided.

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The general design of the above-mentioned experimental air-film-cooled incinerators appears to be sound. Your technical representative has indicated a need for a unit of this type that would provide only about half of the burning capacity as described above, but that otherwise would be similar to the Task Order No. Z experimental unit. A proposed program of research directed toward achieving this aim is described in the following.

Objective

The objective of the proposed program would be to conduct research directed toward the development of a small experimental incinerator which would be based on the design of and would be generally similar to the Task Order No. Z experimental unit, but which would provide only about half of the burning capacity and would be smaller in size.

WPA (3/4)

General Method of Procedure

The effort under the proposed program would be directed toward the development of an experimental incinerator with approximately half the burning capacity, and with other operating characteristics similar to those of the Task Order No. Z experimental incinerator. The operating characteristics of particular interest, in addition to burning capacity, include simplicity and reliability of operation; minimal emission of smoke, fumes, and fly ash; and independence relative to the need for auxiliary fuel other than for the initial ignition of the charge.

It is currently contemplated that the design of the proposed half-capacity unit would be essentially the same as that of the

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above-described larger experimental units. Minor changes necessitated by the reduced size, or indicated to be worth while by the current research under Task Order No. Z or by the field evaluation being conducted by your technical representatives, would be incorporated in the design, wherever feasible. Also, in the course of designing the experimental half-capacity unit, continued attention would be directed toward evolving means of increasing the rate of burning particularly during the late stage of the burning cycle, and for minimizing the amount of incompletely burned paper remaining at the end of the incineration period. Also, it is expected that an improved quick-opening door would be provided.

In the development of a suitable design for the proposed half-capacity unit, our previous experience developed in scaling down combustion equipment would be utilized. Efforts would be made to evolve an experimental unit which would be as small as possible; it is currently expected that the size of the proposed unit can be decreased appropriately. However, it should be realized that scaling down flow equipment is not a simple matter of size ratios; it involves also consideration of flow momentum where mixing and turbulence are concerned. Also, the greater surface-to-volume ratio of the proposed half-capacity unit will result in lower temperatures throughout the unit during operation. This factor will probably be advantageous from the standpoint of the life of the proposed unit, but may aggravate slightly the unburned-residue difficulty.

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In connection with the unburned-residue difficulty, a cursory investigation would be made to assess the effect of using additional insulation on the bottom of the proposed incinerator. The present design of the bottom would be changed from an air-cooled, stainless steel, double-cone type of construction to one consisting of a simple carbon-steel inverted cone covered with about a 3/4-inch-thick layer of castable insulating refractory (weighing about 40 pounds); air would be supplied to this inverted cone from the tangential or radial wall jets located above the cone. A few simple burning experiments would be conducted in the experimental half-capacity unit equipped with this type of refractory-lined bottom. If the results are mutually considered to be favorable, this feature would be incorporated into the design. If the use of the refractory lining on the bottom appeared to have no merit or to lead to additional problems, then the design of the bottom would be allowed to remain unchanged, i.e., the air-cooled, double-cone type of bottom would be utilized.

Can it be shipped?

In general, it is contemplated that extensive over-all evaluation of the proposed half-capacity unit would not be necessary, since the performance of the smaller experimental unit is expected to be quite similar (except for about half the burning rate) to that of the large experimental unit. It is planned that an extended burning experiment would be conducted with intermittent batch feeding of telephone-book paper, to explore the maximum burning capacity of the

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experimental unit. Also, a small number of single-batch runs would be made in order to investigate the completeness of burning of the charge.

Where needed, minor modifications stemming from the burning experiments would be incorporated in the experimental unit, within the limits of the time and funds provided. The experimental unit, with an appropriate stack and minimum instrumentation similar to that provided with the large experimental incinerator, would subsequently be made available to your technical representative for field evaluation.

Reports and Liaison

Monthly letter reports would be submitted to keep your technical representative informed of the progress of the proposed program. These would be supplemented by meetings with your representative. At the conclusion of the proposed research period, a summary report describing the results of the effort would be submitted.

Duration and Estimated Costs

It is proposed that the contract provide for a four-month period of research, with an estimated appropriation of \$7,749, including the fixed fee. The general breakdown of the estimated costs is attached.

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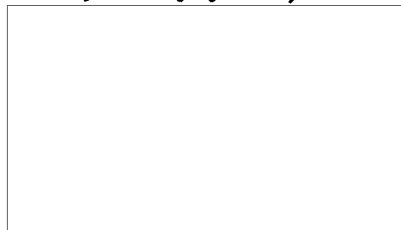
The Contract

The proposed contract would be a period-basis research agreement, consistent with our current contractual arrangements and providing only for a fixed period of research leading toward the objective outlined in this proposal.

If you should have any questions with regard to this proposal, please let us know. Any inquiries of a contractual nature may be directed to at Extension 159.

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Very truly yours,



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EES:mlm

In Duplicate

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